angiosperms, monosulcate pollen (famously shared with *Ascarina*, hutu, where it is identical to the earliest fossil pollen), and anatropic ovule orientation.

It is perhaps worth saying a word about the wider significance of this family. For many decades, evolutionary thinking about angiosperms was dominated by the 'strobilar theory of floral evolution', that the flower originated from a juvenilised gymnosperm (pine-like) cone. This gives a picture of sporophylls (seed leaves) spiralling around an axis, and indeed the magnoliids (including our *Pseudowintera*) fit this picture very well in a number of ways. But 20 years ago, P. Endress alerted botanists to a growing discrepancy between the theory and the fossil record, that the oldest fossil types had living correlates in plants which though recognised as primitive, still had what the strobilar theory would view as very highly reduced or evolved flowers (*Ascarina* is an excellent example of this). He divided the primitive angiosperms into three groups, a group including *Austrobaileya*, another including *Amborella* and *Ascarina*, and a third with *Pseudowintera*, and left the question of priority open. Now genetic research has confirmed his doubts. The magnoliids are today put, not on the first, but the fourth or fifth branch. But on the first branches, 'reduced' flowers are very well represented. Hydatellaceae adds to the weighting. In its case, the reduction can be explained by a submerged habitat. But that such reduction could apparently occur so early still raises questions.

I think Bot Soc president, Mike Wilcox, best captured the excitement of this discovery. In an e-mail to me, he said, "It is now a star plant like *Amborella* – perhaps we could say New Zealand's most famous plant, phylogenetically speaking. It is not a monocot!" Remarkably, Mike is a friend of the researcher who led this discovery, Sean Graham at the University of British Columbia, Canada. Unsurprisingly, Mike met Sean *Amborella*-hunting in New Caledonia.

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In pursuit of *Pittosporum pimeleoides*

Maureen Young

One of the pleasures of botanising in Northland is to occasionally come across the small shrub, *Pittosporum pimeleoides,* (Pittosporaceae). This species consists of two subspecies – *P. pimeleoides* R.Cunn. subsp. *pimeleoides*, and the North Cape endemic, *P. pimeleoides* subsp. *majus* (Cheeseman) R.C.Cooper (Fig. 1). The latter has gone through a number of name changes, beginning with Cheeseman's *P. pimeleoides* var. *major* Cheeseman, then *P. michiei* Allan, and then *P. pimeleoides* subsp. *major* (Cheeseman) R.C.Cooper, (the epithet of which is corrected to "*majus*" though "*maius*" is also acceptable to some) before settling on the present designation. It grows only on the serpentine Surville Cliffs of North Cape, and is an almost vine-like plant with obovate-elliptic leaves, which scrambles for support through the surrounding vegetation. Cheeseman first found it on his visit to North Cape in 1896, and it wasn't seen again until located by Ross Michie in 1945 (Michie 2007).

David Given (1981) estimated that there may then have been fewer than 100 plants of *P. pimeleoides* subsp. *pimeleoides* left in Northland, but subsequent searching has revealed that there are in fact, many thousands. It is a very variable species. It can have narrow leaves not much more than 1 mm wide and ranging up to over 20 mm in width. Katie Reynolds from Whangarei (Reynolds 1983) wrote that it is look-alike to several other species, e.g. mairehau (*Leionema nudum*), mingimingi (*Leucopogon fasciculatus*), kanuka (*Kunzea ericoides*) and the small, narrow-leaved *Alseuosmia linariifolia*. In its "mairehau" form, people sometimes mistake it for *P. pimeleoides* subsp. *majus*, and Tony Foster (1998) from Totara North wrote that he had found this species at Waitaruke on the shores of the Whangaroa Harbour. I have seen these plants; they grow up to 1 m. tall, and have leaves well within the range of *P. pimeleoides* subsp. *pimeleoides*. In fact, many of the Whangaroa Harbour plants are from the wide-leaved end of the range. The narrow-leaved form can look so like young kanuka plants that it takes a very experienced eye to differentiate between the two. The bark on the slender stems of the *Pittosporum* is shiny and dark brown, compared to the lighter coloured, more textured bark of kanuka. If all else fails, the aromatic scent of crushed kanuka leaves will settle the argument.

The distribution centres on the Bay of Islands, Whangaroa Harbour, Mangonui, Taipa, and north and east of Kaitaia (Fig. 2); there are no records from the Aupouri Peninsula. Kevin Matthews from Awanui showed me the one plant that he has found on the Karikari Peninsula. There are occasional outliers at Waipoua Forest, Ngawha and Titoki. Many of the old records, particularly those of R.H. Matthews, H. Carse

and T. Kirk, give vague locations, such as "near Kaitaia" or "Mangonui County".

Fig. 1. Syntype of *Pittosporum pimeleoides* subsp. *majus* (AK 4692).

During the January 1990 Bot Soc field trip now known as the "Great Wairau Massacre", which took us down the Wairau River, Waipoua, a good population of *P. pimeleoides* was seen growing near a series of waterfalls in the river. The leaves were very variable there, and the female plants had a sprinkling of green capsules.

In 1993 Noeline Clements found a single plant at the William Upton Hewett Reserve, near Titoki, west of Whangarei. This was well south of other known populations, and for many years it seemed to be an anomalous record. Recently Lisa Forester (Northland Regional Council) and Nan Pullen (Queen Elizabeth II Trust representative) were checking out a potential covenant site a few kilometres north of the Hewett Reserve, when the sharp-eyed pair spotted many plants in the kanuka disguise. In the company of John Kendrick I later checked out this site, and then we went to the Hewett Reserve to try to relocate Noeline's plant.

The Hewett Reserve consists of a large area of gumland scrub, with some taller vegetation in the gullies. The description, "Old gully with totara, kauri etc" was of little use; it was a needle-in-a-haystack situation. John Kendrick and I walked along the perimeter track until we were as close as we could get to the first gully of taller vegetation. John was feeling less than his usual ebullient self, so he wisely found a sheltered spot in the umbrella fern (*Gleichenia dicarpa*) and rested, while I made the foolhardy decision to search the gully. I had a near vertical drop through fern before I got to the bush - gravity took care of that part of the trip. I lowered myself some way down through the bush, but after deciding that it didn't look a likely spot, and bearing in mind the climb up again, I crossed the stream and started the ascent on the opposite ridge. Just past a large kauri tree with a strangely bulbous base I paused to puff, and found myself eyeing a small-leaved plant. "Hullo, what are you?" Dark brown, shiny, slender trunks and shiny, dark green leaves without the aromatic smell of kanuka. Yes, there were seven plants of *P. pimeleoides*.

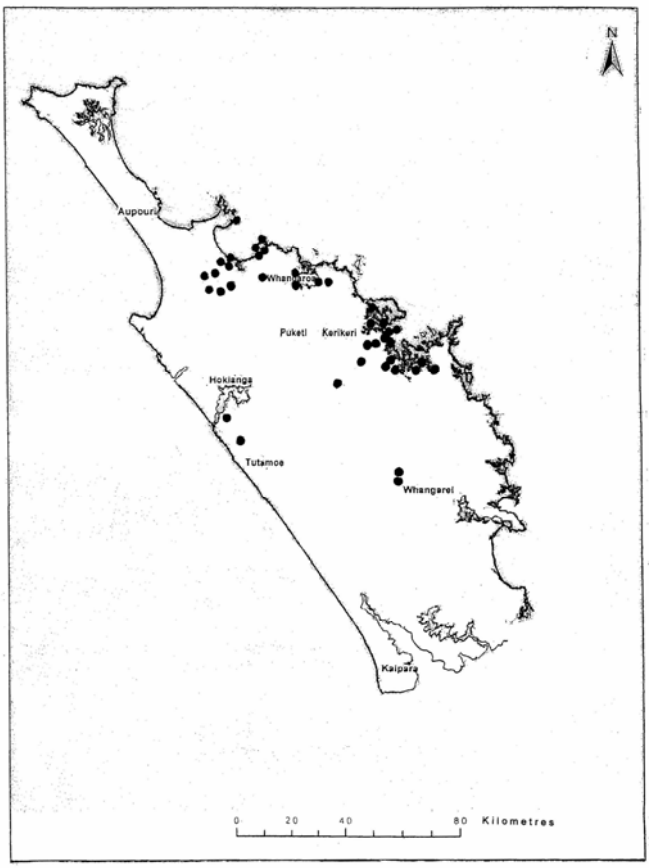

Fig. 2. Distribution of *Pittosporum pimeleoides* subsp. *pimeleoides*.

Pleased that this venture had not been in vain, I got to the edge of the bush and started the steep, upward climb through umbrella fern (the name "tangle fern" was more appropriate here), bracken, *Lycopodiella cernua,* manuka and the prickly *Hakea sericea*. I literally inched my way through the growth, which was head-high in the hollows and waist-high on the ridges,

the climb made more difficult because I only had one hand with which to hold on. The other hand was clutching a precious specimen, and I was remembering what I had read in an old Bot Soc Newsletter – Bob Cooper, erstwhile botanist at the Auckland Museum, once stated, "If you must choose between your life and the safety of the specimens, remember the specimens come first". When I got within earshot John began calling out encouraging messages, and I finally collapsed beside the track, with just enough energy left to appreciate his story of a black piglet trotting past him while he waited for me.

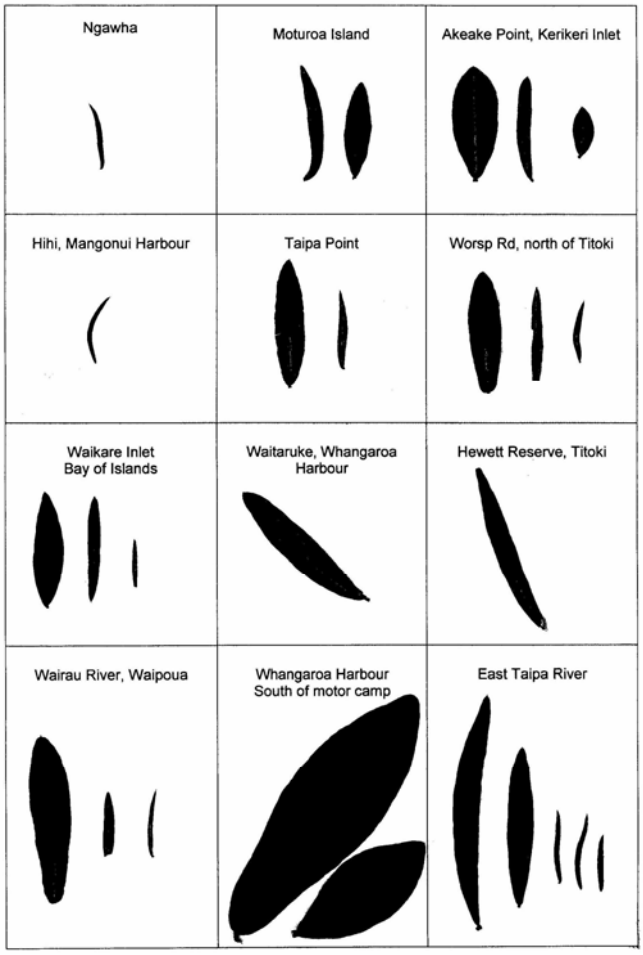

Fig. 3. Leaf silhouettes of *Pittosporum pimeleoides* subsp. *pimeleoides* from a representaive sample of sites. (1/4 actual size).

In the northern end of its range I have been indebted to local enthusiasts for showing me where the plant grows; Kevin Matthews for the Karikari plant, and the Hihi population on the Seon property where the Bot Soc Easter campers were so intrigued by such a cryptic plant (Young 2007); Michael Winch for taking me to the Waitaruke site; and most especially Bill Campbell, for following up old records as I fed him the information. Two of these sites were near Taipa. The plants were typically small, with small leaves and a lax habit, and many seedlings were growing close by. Occasional plants reached above head-height, but had very slender stems. Some had leaves in the intermediate to larger range. We agreed that there was much suitable habitat nearby, and diligent searching would probably disclose more records.

Two specimens in the Auckland Museum herbarium (AK) were from the same site, a corner of the road leading to the Whangaroa motor camp. Bill located this wide-leaved plant, and as he knew the people who owned the property on the ridge above the site, with their permission he searched the area. He found there what he estimates to be thousands of plants. When he showed me one plot I couldn't believe what I saw – the leaves were 70 mm long and over 20 mm wide – what a contrast to the tiny, narrow leaves with which we had become so familiar. This was a stunning example of variation within a species (Fig. 3).

In the Bay of Islands, there are several records from the Opua Forest. On the Opua to Paihia Track I walked some distance before coming across plants. The first few had leaves in the intermediate range, and after seeing them I had to check out all the narrow-leaved *Alseuosmia* that also grew along the track. Although they had a similar appearance, the similarities were fairly superficial. I nearly missed seeing the second plot of narrow-leaved plants, surrounded as they were by mingimingi, but one had ripe capsules to clinch its identity. While musing on this constant problem of distinguishing one species from similar species in different genera, I was reminded of Ian Atkinson's 1989 Lucy Cranwell Lecture, "Looking at plants with the eyes of a moa" (Atkinson 1991), and wondered if this was a case of mimicry, developed to deter moa browsing. But would mingimingi, kanuka, mairehau and *Alseuosmia* be any less palatable than *P. pimeleoides*? Also in the Opua Forest, on the lovely Kauri Walk, now closed unfortunately, the ridges were abundantly clothed with small, lax plants.

At the end of Opito Bay is a point of land known as the Akeake Reserve. For anyone visiting the Bay of Islands and wanting to see abundant *P. pimeleoides,* this is the place to go, and June and July the months when it flowers. Besides the chance of being misled by kanuka and ordinary mingimingi, beware here also of prickly mingimingi (*Leptecophylla juniperina*) and the sweet pea shrub (*Polygala myrtifolia*). Using a lens, one can check out the wispy hairs on the leaves of the target plant.

Katie Reynolds claimed that male and female plants could be easily distinguished by the width of the leaves, but I have seen capsules on both the narrow-leaved and wide-leaved plants. As she also stated, the flowers, borne in winter, have a very pleasant perfume. I once had a plant growing in a pot, a male plant that never-the-less occasionally bore the odd capsule, and I noted that the perfume seemed to be strongest at night. Perhaps the flowers are moth pollinated.

Acknowledgements
My thanks to Mei Nee Lee & Ewen Cameron, Patrick Brownsey, Jane Cruickshank & Aaron Wilton from the Auckland, Te Papa and Christchurch herbaria respectively, for records from their databases, and Wendy Holland for Department of Conservation records. Lisa Forester gave me the benefit of her long years of experience in the North. Thanks to Michael Winch, Kevin Matthews and Bill Campbell for sharing their local knowledge, John Kendrick and Anne Fraser for their company in the field, and B. & G. Wilson and D. & J. Macky for permission to visit their properties.

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The Extreme North

An unpupublish manuscript by Ross Michie (1894 – 1987), edited by Maureen Young

On 8 June 1945, accompanied by my son Stan, we set out on a survey to Kerr Point near the North Cape, the object being to make a survey of the bird life on the Ninety Mile Beach and the extreme north. It was proposed also to make another search for *Pittosporum pimeleoides* var. *major* [*P. pimeleoides* subsp. *majus*]. It was almost twelve months to the day since Messrs. Beddie, Potts, Finlayson and myself made the trip to the North Cape on a botanical survey. In spite of tireless searching on that occasion we failed to locate the *Pittosporum* referred to. However, Mr. Finlayson has the habit of delving into botanists' past work, and has busied himself since the previous trip in locating the late Mr. Cheeseman's diary on his northern trip in 1896, in which a good indication was given as to where the plant in question was to be found. So thanks to Mr. Finlayson, with this account in my pocket we set off.

Travelling from Kaitaia via the Ninety Mile Beach we reached a point known as Te Werahi. We were then within two miles or so of the new Cape Maria lighthouse on the extreme western tip of the northern coastline. It was just sunset when we arrived at our camping site. We had a hasty meal, prepared a mattress of rushes, and settled down for the night, having in mind to rise at daylight and get under way on our long trek of about twenty-three miles to Kerr Point.

We awakened very early next morning and welcomed the dawn, and with it a clear cloudless sky. Without delay we packed our swags with a minimum of rations, blankets and a change of clothes and before sunrise were away – unfortunately to a false start, the tide being full in we were unable to cross the Te Werahi Stream. This delayed us for an hour and a half. However, once across it we made good progress and immediately commenced to climb a steep hill, which is the commencement of a chain of hills at places reaching a height of 800 to 900 feet. This runs parallel to the sea practically unbroken as far as Spirits Bay, where the chain stops abruptly, there being a large swamp behind the sandhill skirting the beach. The chain reappears at the eastern end of Spirits Bay and continues to Tom Bowling Bay where it again stops abruptly. The formation of these hills is very different from the hilly country immediately adjoining, which is of very poor quality, clothed with the usual stunted teatree, *Leucopogon*, rushes etc. The soil on the ridge along the coastline is of fair quality, and for the most part is in grass, with sheep, cattle and horses grazing contentedly, giving the place quite a homely appearance. Here and there, on the southern slopes of the ridge, are small pockets of bush ranging from a few trees to patches several acres in extent. These contain the usual northern trees, puriri, rewarewa, taraire, pohutukawa, karaka and many of the small shrubs, and provided quite a pleasant break in the scenery.

On our left, immediately below, was the Tasman, glittering dazzlingly in the bright sunshine. We were soon past the rugged cliff face of Cape Reinga, a spot around which so much Maori legend centres. After tramping for two and a half hours, we descended a long steep hill to sea level, (the Maori name for this spot being Tapotupotu), where we came to the first fresh water stream after leaving our starting point. So far the going was very strenuous, as it had been a series of continual climbing or descending razorback hills. After a pause of fifteen minutes we were on the move again, leading straight up another steep hill. We followed the ridge for a couple of miles or so, then descended to sea level once more, to a small bay eight chains long. This is another interesting spot, being known as Pandora.

From here we followed the rocks around precipitous cliffs and reached Spirits Bay. Here is a soft steep sandy beach four or five miles long, with a very low sandhill running along its entire length, and several chains deep. On this grows a sprinkling of *Coprosma acerosa*, *Muehlenbeckia complexa, Cassinia* [*Ozothamnus leptophyllus*] and *Pimelea arenaria*.

Directly behind this low sandy hill is a large swamp, which narrows abruptly after the first mile, but for